

CALIXPYRROLES, CALIXPYRIDINOPYRROLES AND CALIXPYRIDINES

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Abstract of the Disclosure

10 The present invention provides calixpyrrole, calixpyridinopyrrole, and calixpyridine
macrocycles, having 4, 5, 6, 7, or 8 heterocyclic rings, as well as syntheses, derivatives,
conjugates, multimers, and solid supports thereof. Such macrocycles have proved to be effective
and selective ion- and neutral molecule-binding agents forming supramolecular ensembles, and
ion- and neutral molecule-separation agents. The macrocycles are fully *meso*-non-hydrogen-
substituted porphyrinogens, a few molecules of which were previously known but not
15 recognized as possessing anion- or molecule-binding properties. The binding mode is
noncovalent, primarily that of hydrogen-bonding, thereby providing a new mode for liquid
chromatography, that of Hydrogen Bonding Liquid Chromatography. Further useful
applications of the macrocycles provided herein include environmental remediation by removal of
undesired ions or neutral molecules, and removal of phosphate for kidney dialysis.

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